CLAIMS

1. A method for forming a MSiON or MSiO dielectric film comprising the steps of:

vaporizing a metal source (M) to form a vaporized metal source;

feeding a plurality of precursors to a deposition device, wherein said precursors comprise said vaporized metal source, a silicon source, an oxygen source, and a nitrogen source if MSiON is desired ; and forming a dielectric film, wherein said dielectric film is formed with the desired final composition absent a post deposition step.

2. A method for forming a MSiN metallic film comprising the steps of:

vaporizing a metal source to form a vaporized metal source;

feeding a plurality of precursors to a deposition device, wherein said precursors comprise said vaporized metal source, a silicon source, and a nitrogen source ; and forming a metallic film, wherein said metallic film is formed with the desired final composition absent a post deposition step.

3. The method of claim 1 or 2, wherein said silicon source comprises a molecular structure absent carbon and/or a molecular structure absent chlorine.

4. The method of one of claims 1 to 3, wherein said silicon source is in vapor phase.

5. The method in accordance with one of claims 1 to 4, wherein said silicon source has a vapor pressure of at least about 50 torr at 20°C.

6. The method according to one of claims 1 to 5, wherein said silicon source is selected from the group comprising disiloxane, trisilylamine, disilylamine, silylamine, tridisilylamine, aminodisilylamine, tetrasilyldiamine, disilane, derivatives of disilane and/or trisilane, and mixtures thereof.

7. The method according to one of claims 1 to 6, wherein said oxygen source comprises a molecular structure absent carbon and/or a molecular structure absent chlorine.

8. The method according to one of claims 1 to 7, wherein said oxygen source is selected from the group comprising oxygen, nitrous oxide, ozone, disiloxane, and mixtures thereof.

9. The method according to one of claims 1 to 8, wherein said nitrogen source comprises a molecular structure absent carbon and/or a molecular structure absent chlorine.

10. The method according to one of claims 1 to 9, wherein said nitrogen source is the same as said metal source, said silicon source and/or said oxygen source.

11. The method according to one of claims 1 to 9, wherein said nitrogen source is ammonia.

12. The method according to one of claims 1 to 11, wherein said metal source is selected from the group consisting of a dialkylamino, and/or alkoxy ligands

13. The method according to one of claim 1 to 12, wherein said metal source is an inorganic compound selected from the group consisting of hafnium (Hf), zirconium (Zr), titanium (Ti), niobium (Nb), tantalum (Ta), scandium (Sc), yttrium (Y), lanthanum (La), gadolinium (Gd), europium (Eu), praseodymium (Pr) or any another lanthanide (Ln), and mixtures thereof.

14. The method according to one of claim 1 to 13, wherein the amounts of said metal source and said silicon source in said desired final composition of said dielectric film are controlled independently.

15. The method according to one of claim 1 to 14, wherein said dielectric film is completed by using a chemical vapor deposition process.

16. The method according to one of claim 1 to 14, wherein said dielectric film step is completed by using an atomic layer deposition process.

17. A MSiON or a MSiO dielectric film obtained in accordance with the process of any of the claims 1 and/or 3 to 16.

18. A MSiN metallic film obtained in accordance with the process of any of the claims 2 to 16.